National Institute of Environmental Health Sciences

The impact of excess heat events in Maricopa County, Arizona: 2000--2005

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Abstract:

Exposure to excess heat is preventable yet it is the primary weather-related cause of mortality in the United States. In the Southwest United States, high temperatures are common and indoor environments often have cooling devices. In summer 2005, Maricopa County, Arizona experienced a 182% increase in reported heat-related deaths in comparison to 2000--2004. We examined at-risk populations and excess mortality. We characterized heat-related deaths using descriptive and multivariate time-series analyses of county vital record data from June-September 2000--2005. Dose-response relationships for heat-related mortality and heat index were evaluated using linear and quadratic splines. From June-September, 2000--2005, 136 heat-related deaths (0.68 per 100,000) were reported; 49 (36%) occurred in 2005. In July 2005, a 14-day heat wave resulted in 28 (57%) reported deaths--a 102% increase in comparison to the same time period in 2000--2004. Decedent demographics in 2005 did not differ from previous years. The mean age of all 136 deaths was 56 years (range: 7-92 years). Of those with discernable reported injury locations, 62 (66%) were identified outdoors. Forty-eight (77%) decedents identified outdoors were < 5 years; conversely, 26 (82%) decedents who were found indoors were > or Euro Surveillance (Bulletin Europeen Sur Les Maladies Transmissibles; European Communicable Disease Bulletin) 65 years. A 6% (95% CI: 1.00-1.13) increase in mortality risk was observed for each degree (F) increase in heat index. Excess heat impacted a younger population in Maricopa County and many deaths occurred outdoors. Consecutive days of heat exposure--even among a heat-acclimated population--can increase mortality risk. Public health response activities guided by locally obtained data will better target those at risk.

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Resource Description

Communication: ☒

resource focus on research or methods on how to communicate or frame issues on climate change; surveys of attitudes, knowledge, beliefs about climate change

A focus of content

Other Communication Audience: Local governments

Early Warning System: ☒

resource focus on systems used to warn populations of high temperatures, extreme weather, or other elements of climate change to prevent harm to health

A focus of content

Exposure :

weather or climate related pathway by which climate change affects health

Temperature

Temperature: Extreme Heat

Geographic Feature:

resource focuses on specific type of geography

Desert

Geographic Location:

resource focuses on specific location

United States

Health Impact:

specification of health effect or disease related to climate change exposure

Injury

Mitigation/Adaptation:

mitigation or adaptation strategy is a focus of resource

Adaptation

Population of Concern: A focus of content

Population of Concern:

populations at particular risk or vulnerability to climate change impacts

Elderly

Resource Type:

format or standard characteristic of resource

Research Article

Timescale:

time period studied

Time Scale Unspecified

Vulnerability/Impact Assessment:

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

A focus of content